

A world map with a color-coded overlay, likely representing ecological vulnerability or exposure forecasts. The colors range from light pink to dark red, with higher concentrations of red in the tropics and southern regions, and more pink in the northern and high-latitude areas. The map is semi-transparent, allowing the text to be overlaid clearly.

Exposure Forecasts: Anticipating Ecological Vulnerability to Global Change

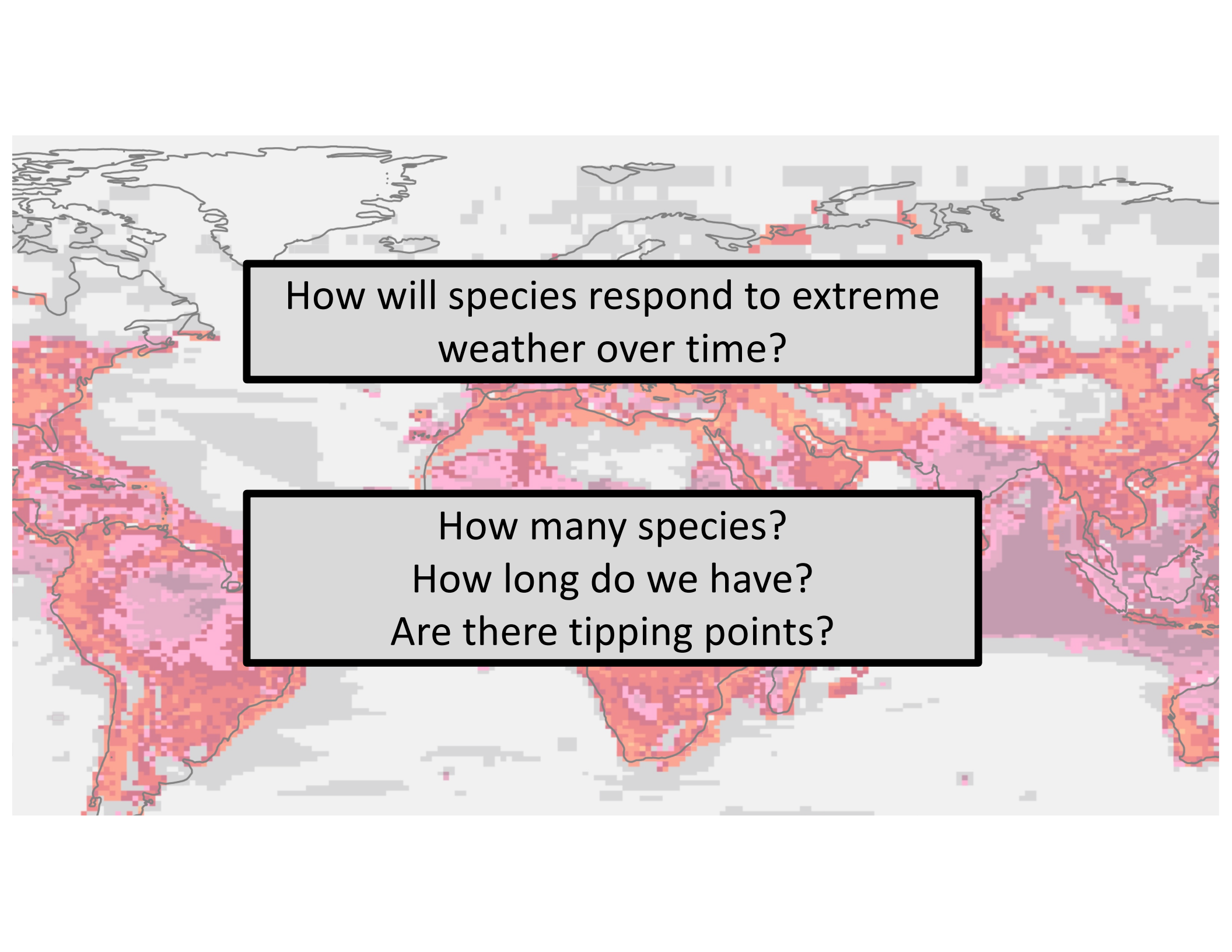
Cory Merow

Mark Urban

Pep Serra-Diaz

University of Connecticut

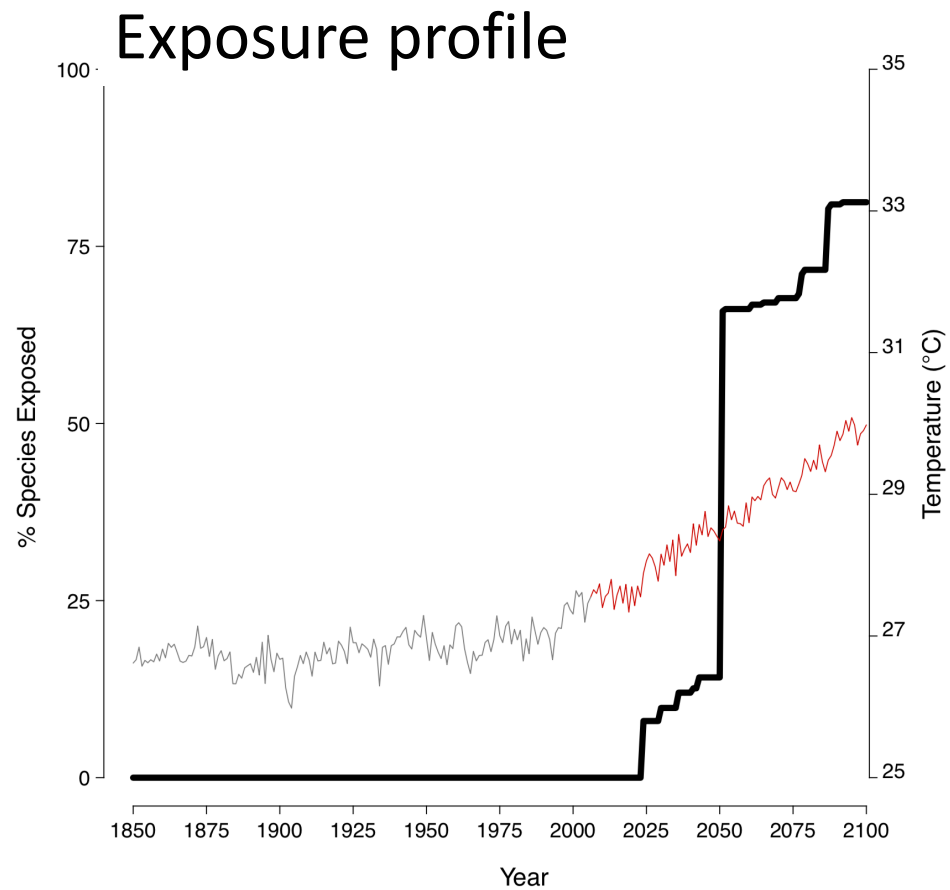
**Eversource Energy Center and
Ecology and Evolutionary Biology**

A world map showing projected climate change impacts. The map uses a color scale from light pink to dark red to indicate the severity of projected temperature increases. Darker red areas are concentrated in the tropics and subtropics, while lighter pink areas are found in the temperate zones. The map is overlaid with a grid of latitude and longitude lines.

How will species respond to extreme weather over time?

How many species?
How long do we have?
Are there tipping points?

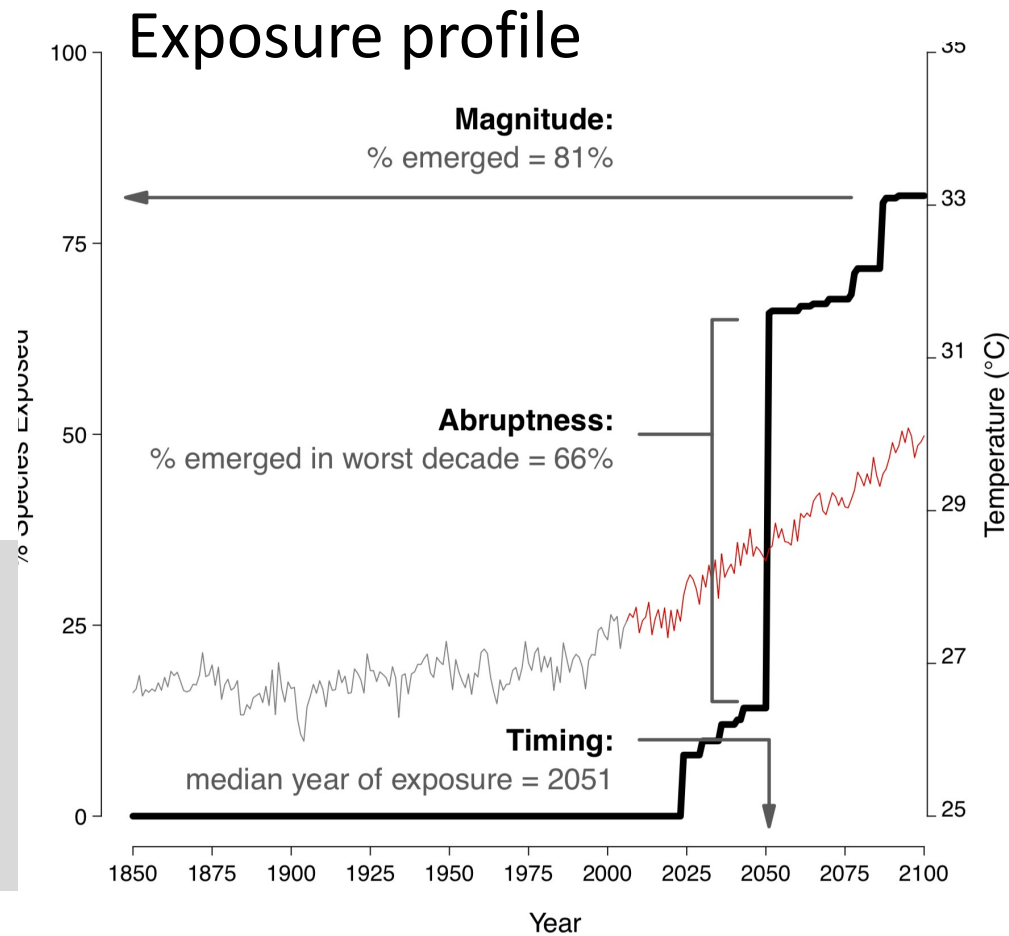
% of species
in assemblage
exposed



Trisos, Merow and Pigot, *Nature*, 2020

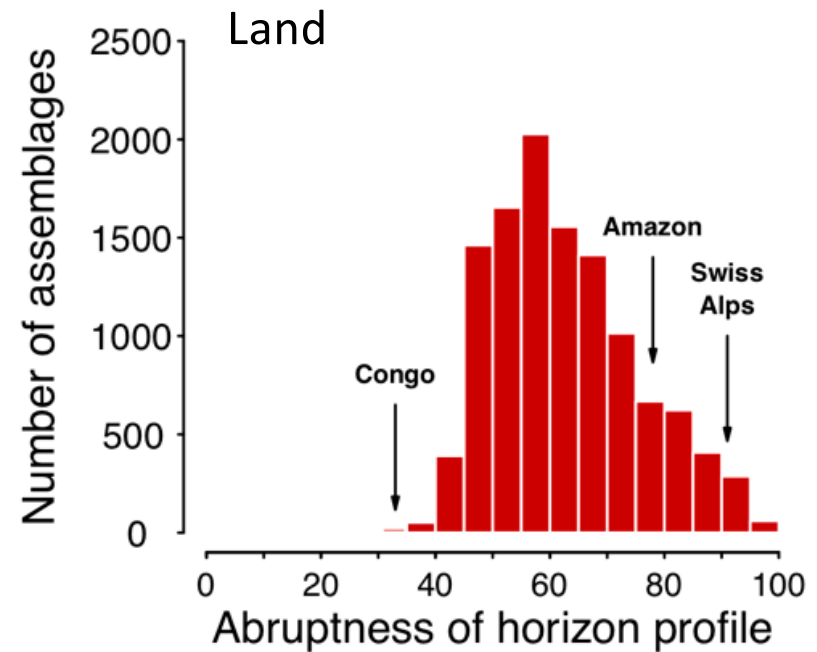
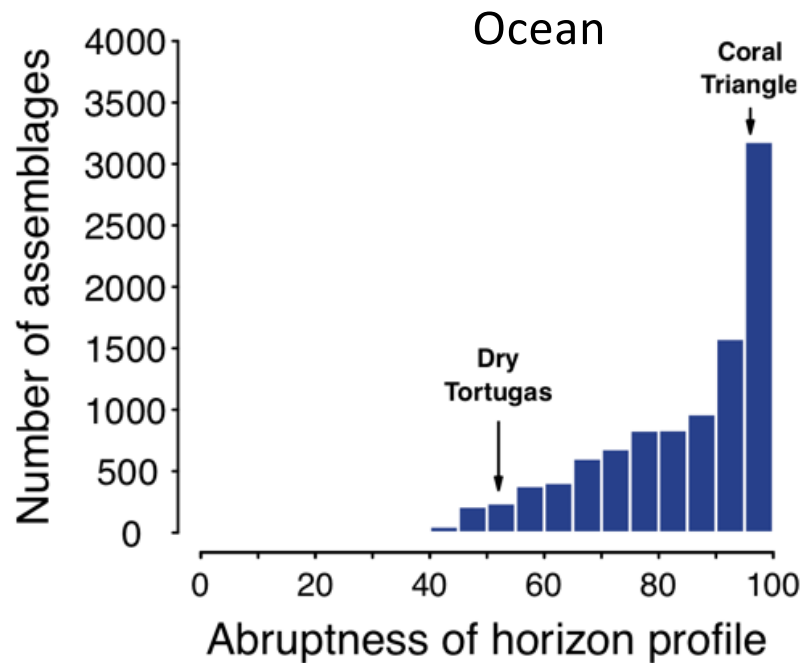
% of species
in assemblage
exposed

OR
% of a single
species range
exposed



Trisos, Merow and Pigot, *Nature*, 2020

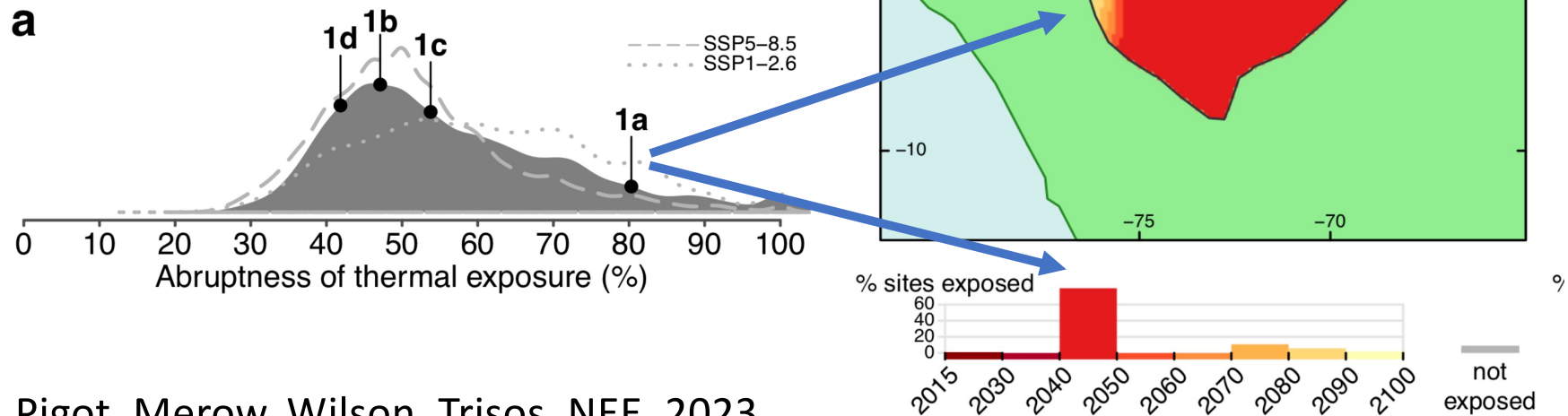
Abruptness is the rule!



Trisos, Merow and Pigot, *Nature*, 2020

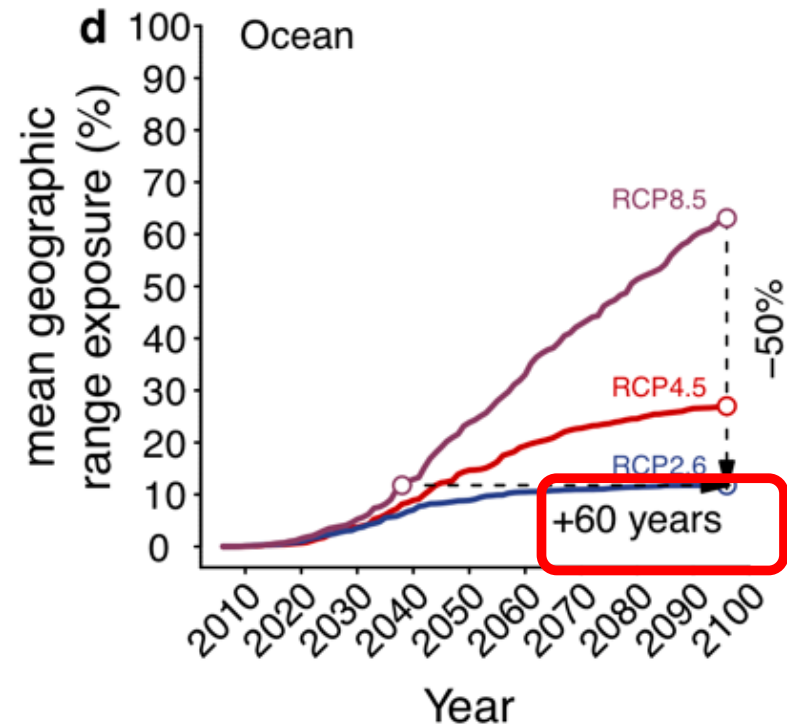
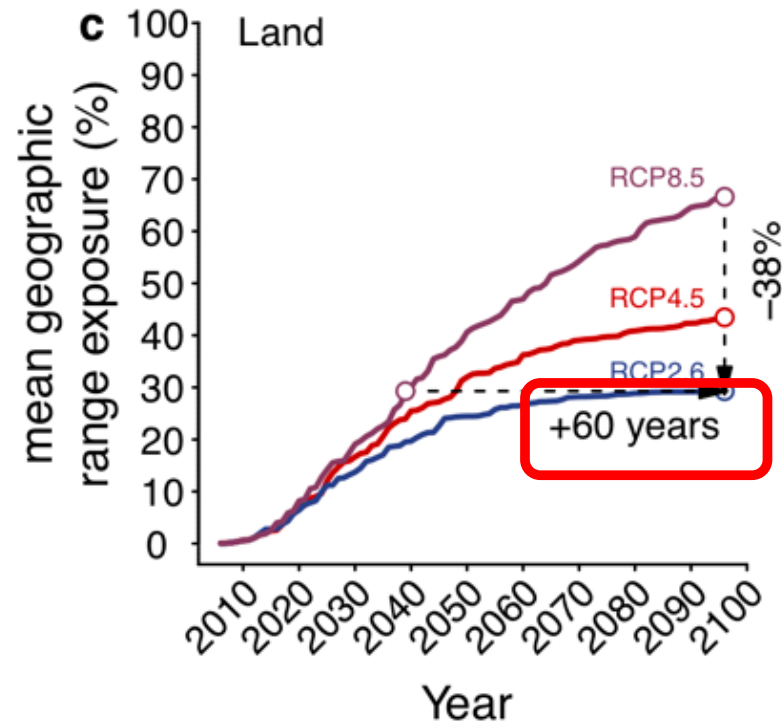
Timing of exposure across species ranges

Distribution of abruptness across 30,000 species assessed by IUCN



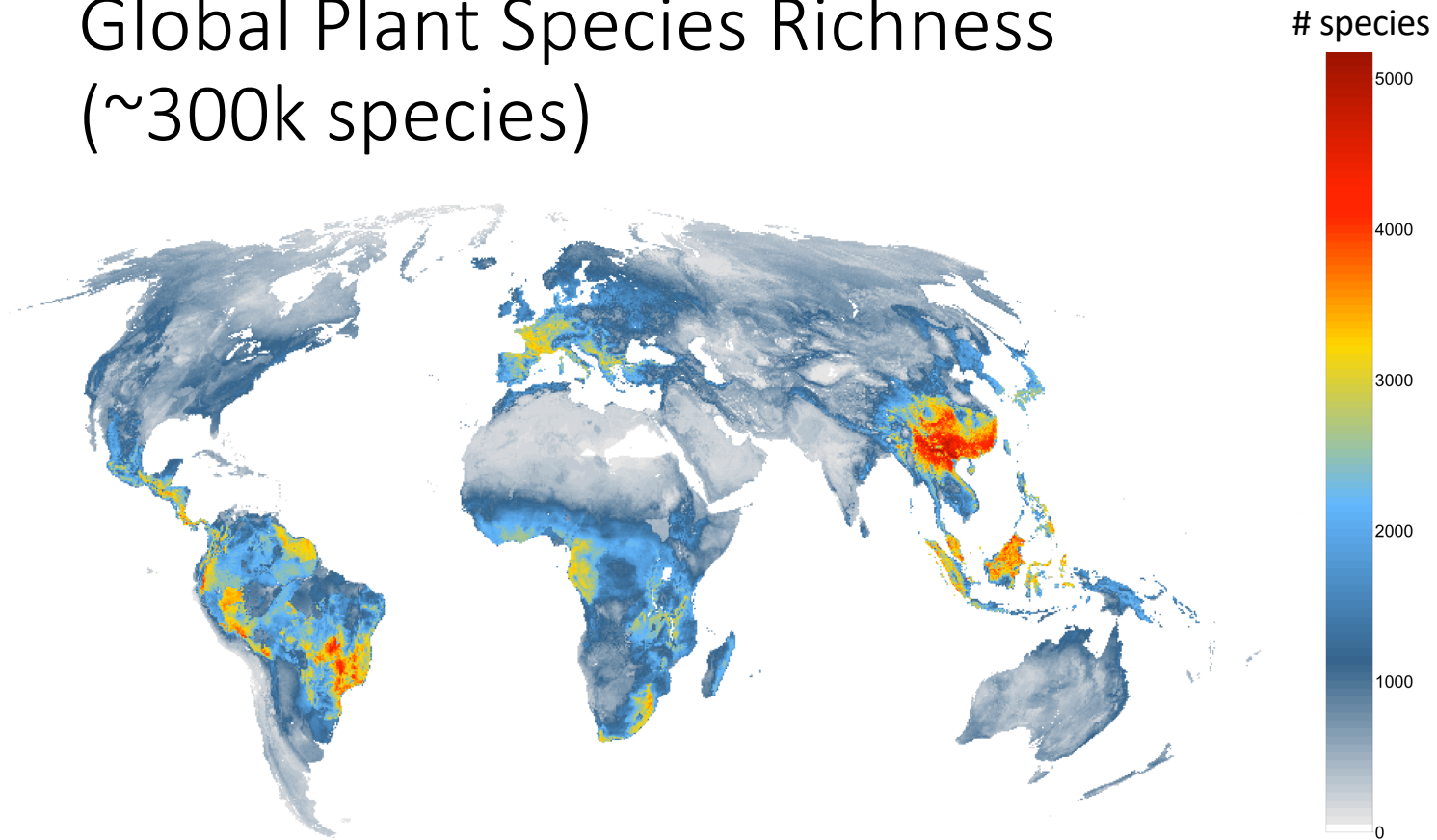
Pigot, Merow, Wilson, Trisos, NEE, 2023

How long do we have?



Next Steps....

Global Plant Species Richness (~300k species)



Merow, Feng, Boyle, Maitner, Enquist, et al., Some day

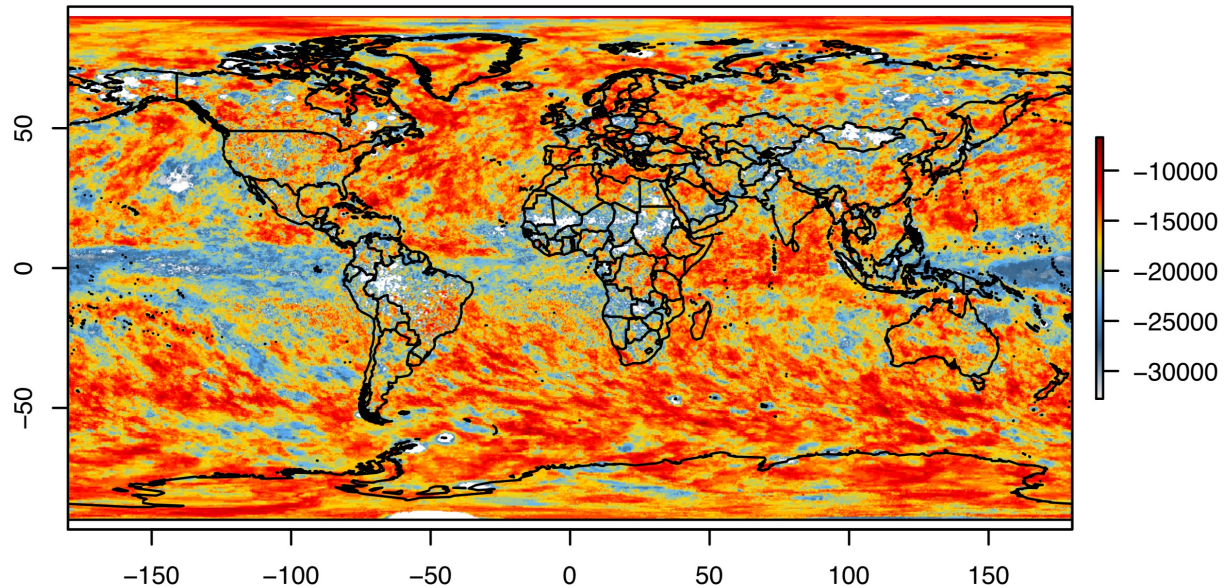
Next Steps....

New Environmental Layers

Global drought intensity, frequency, duration and severity

(NASA NEXGDDP CMIP6)

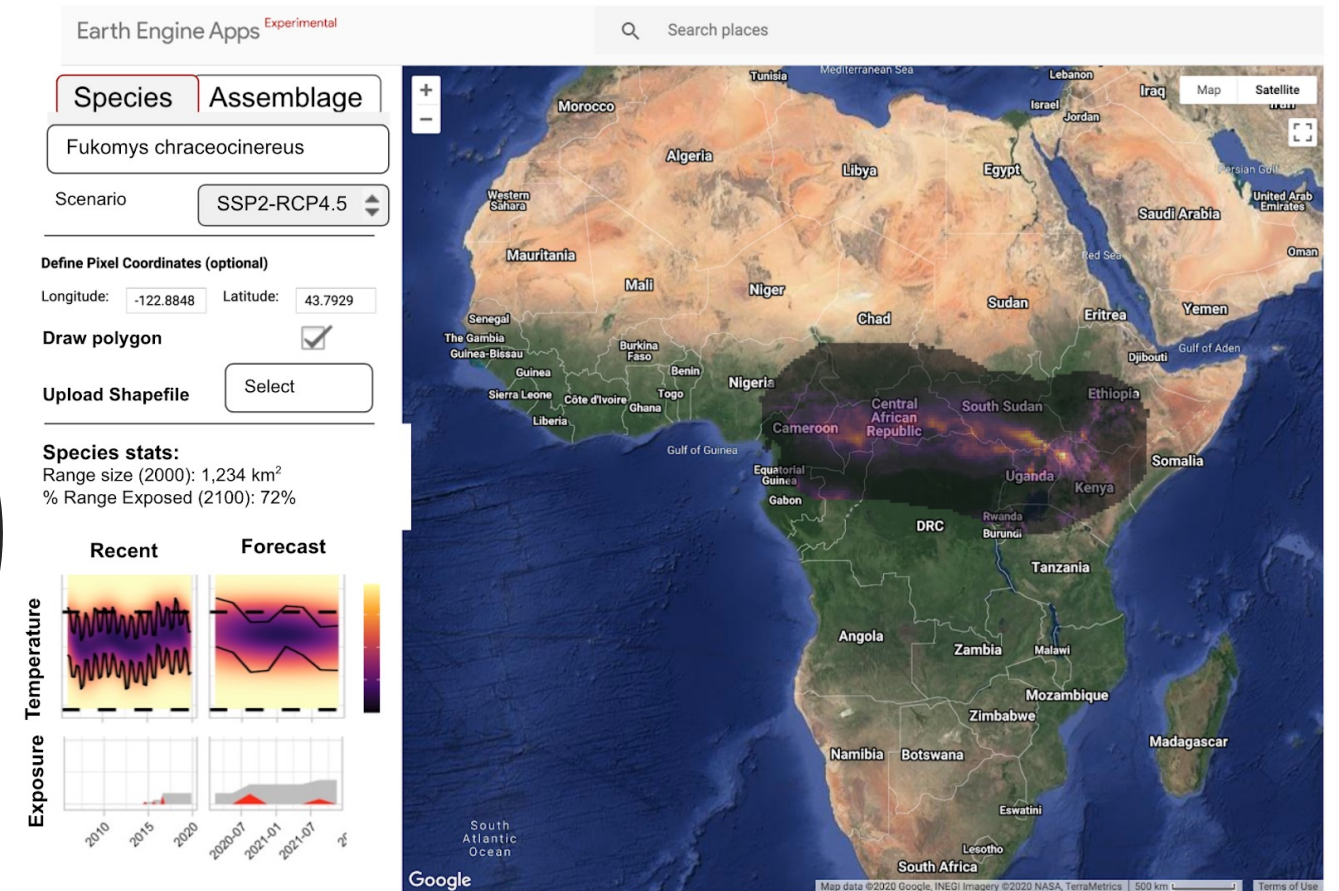
Average 12 Month Severity 1979-2016



Nikolopoulos, Araujo, and Merow, *In Prep*

Next Steps....

Web App
for custom
spatial and
taxonomic
applications

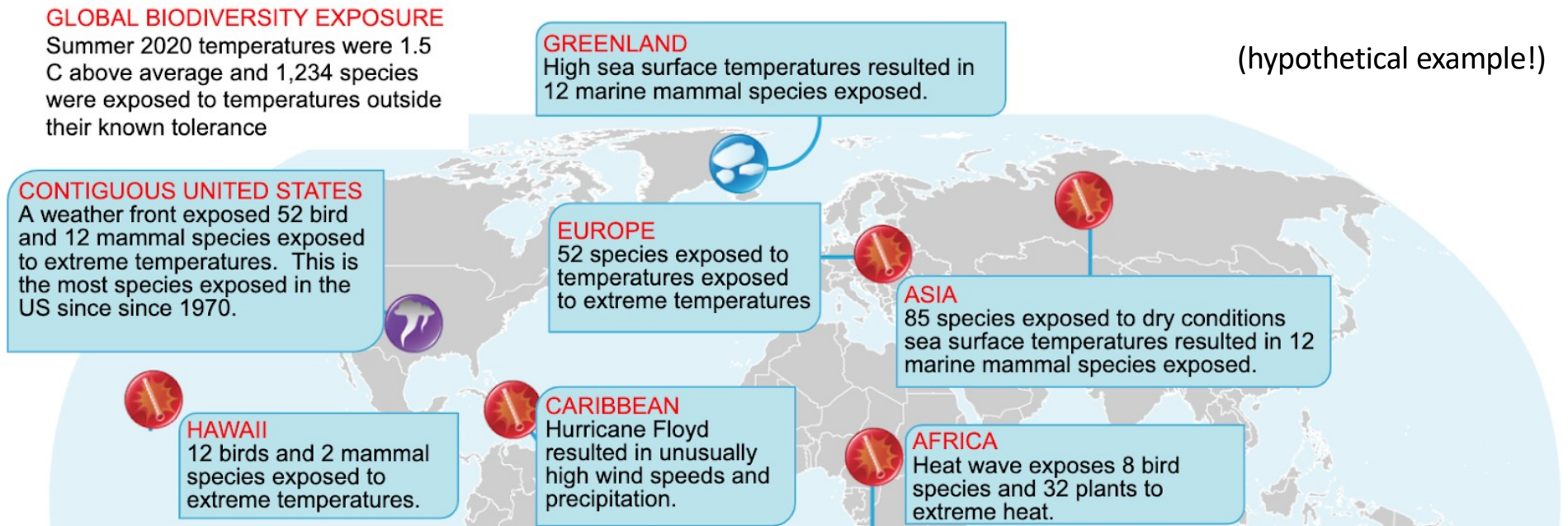


Next Steps....

Monitoring Exposure Events

Significant Summer 2020 Biodiversity Exposure Events

(hypothetical example!)



(Using NASA GEOS Seasonal Products)

Thanks!

Pep Serra-Diaz

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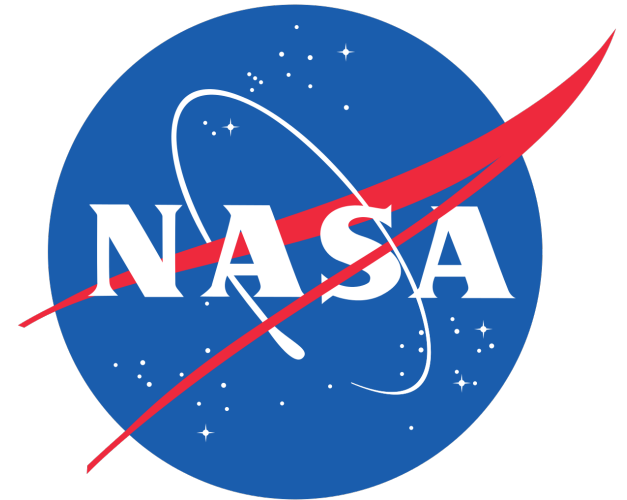
Diogo Araujo

Adam Wilson

Chris Trisos

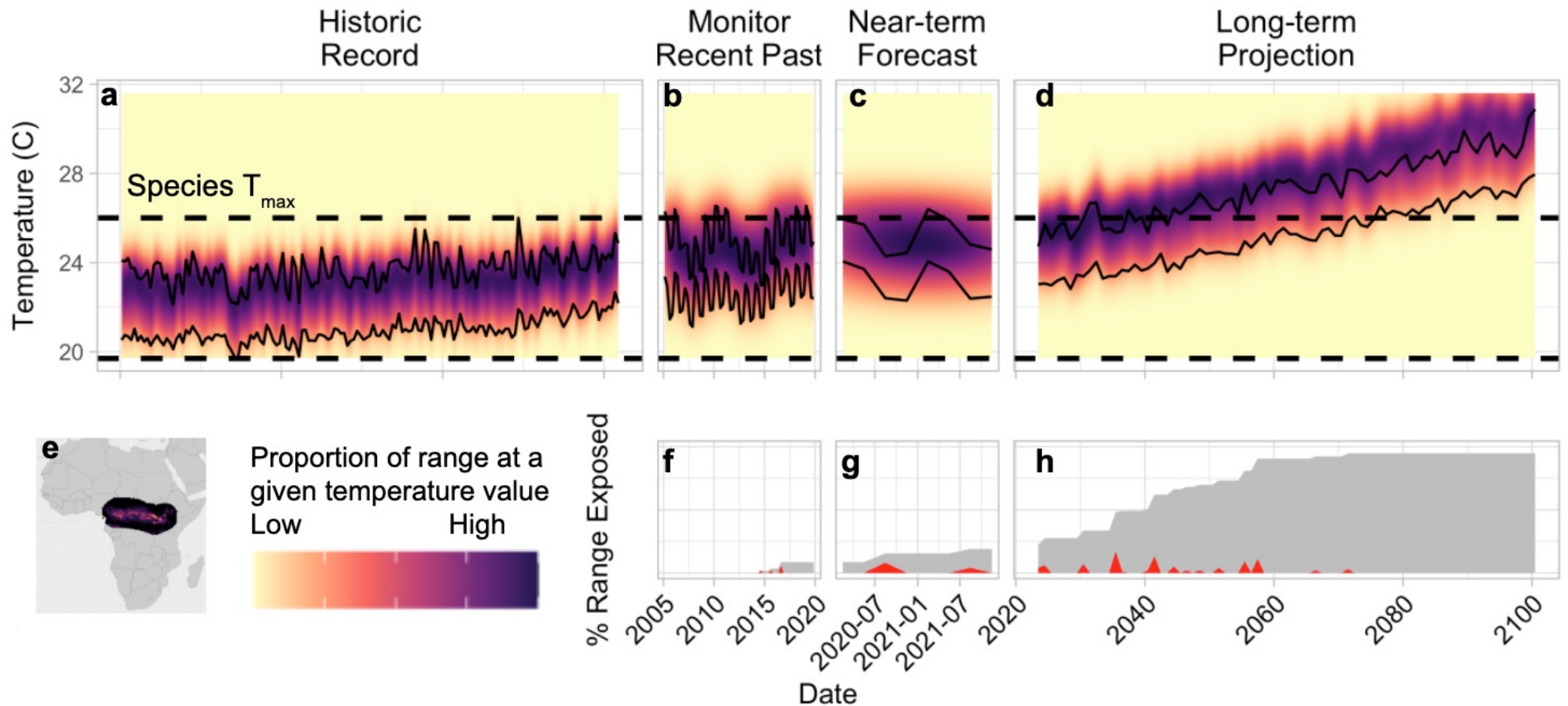
Alex Pigot

Questions?



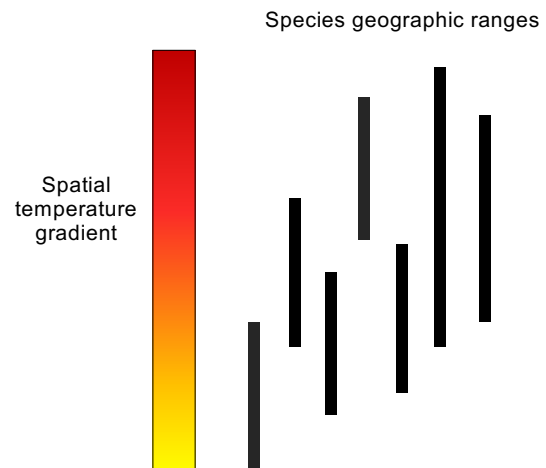
BONUS SLIDES

Exposure of locations across species' ranges



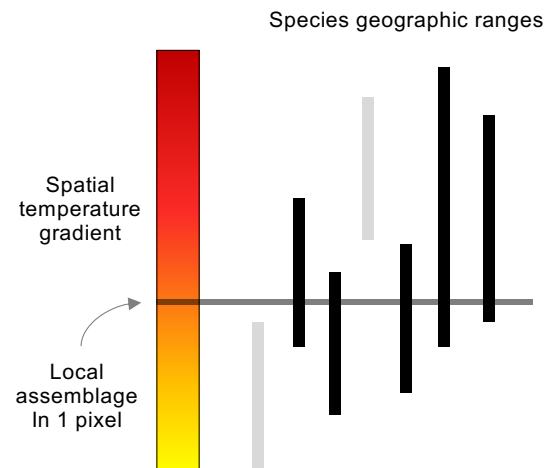
Assessing species' exposure to novel climate

The climate horizon profile



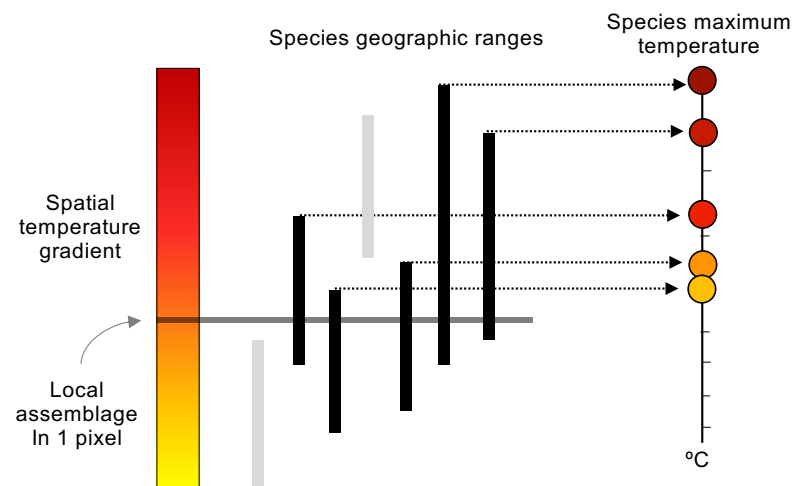
Assessing species' exposure to novel climate

The climate horizon profile



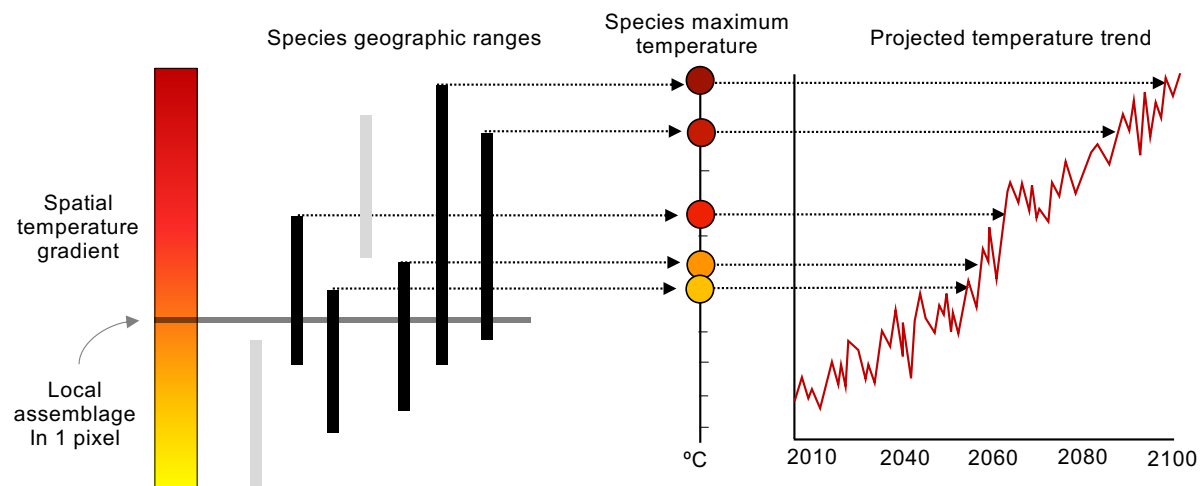
Assessing species' exposure to novel climate

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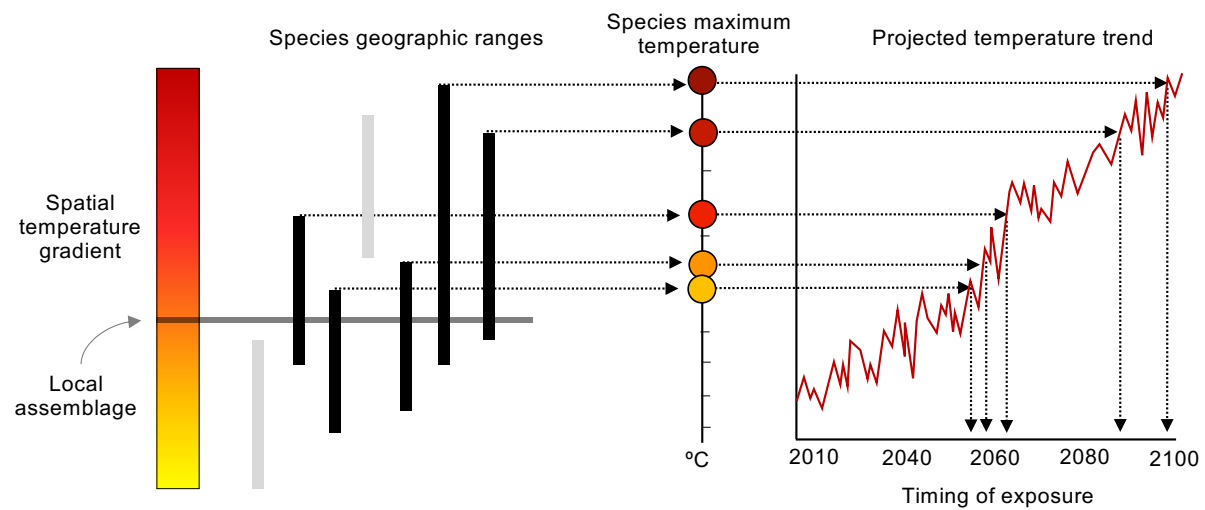
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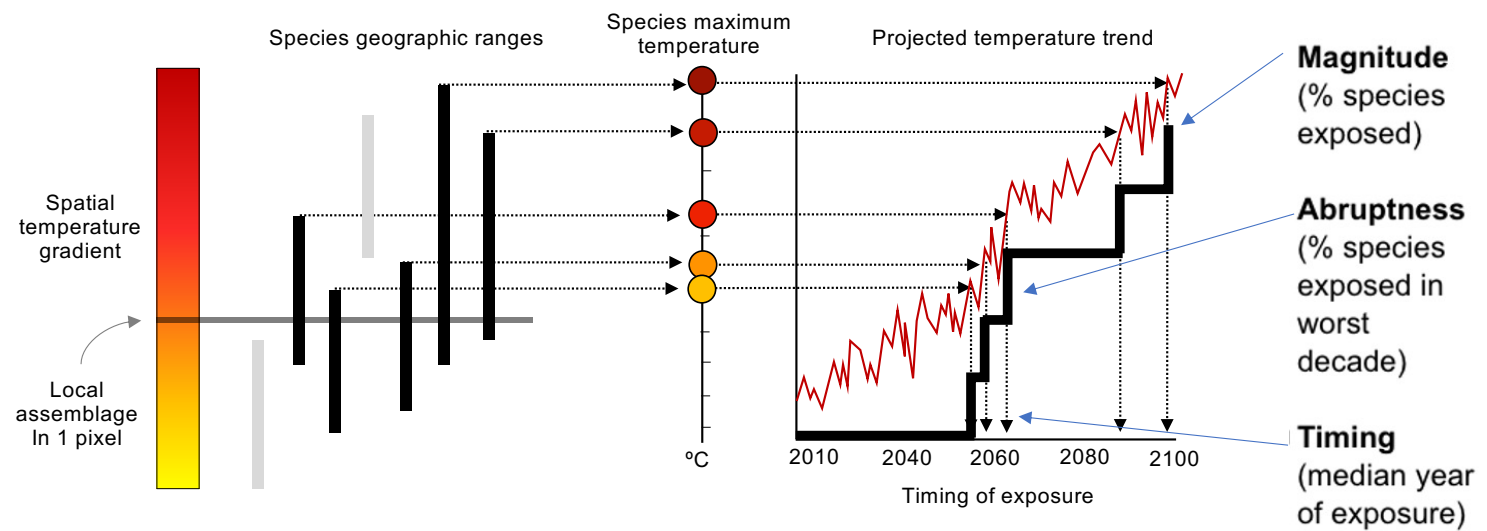
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Trisos, Merow and Pigot, *Nature*, 2020